USPTO JUL 27 2006 PATENT & TRADEMARK OFFICE

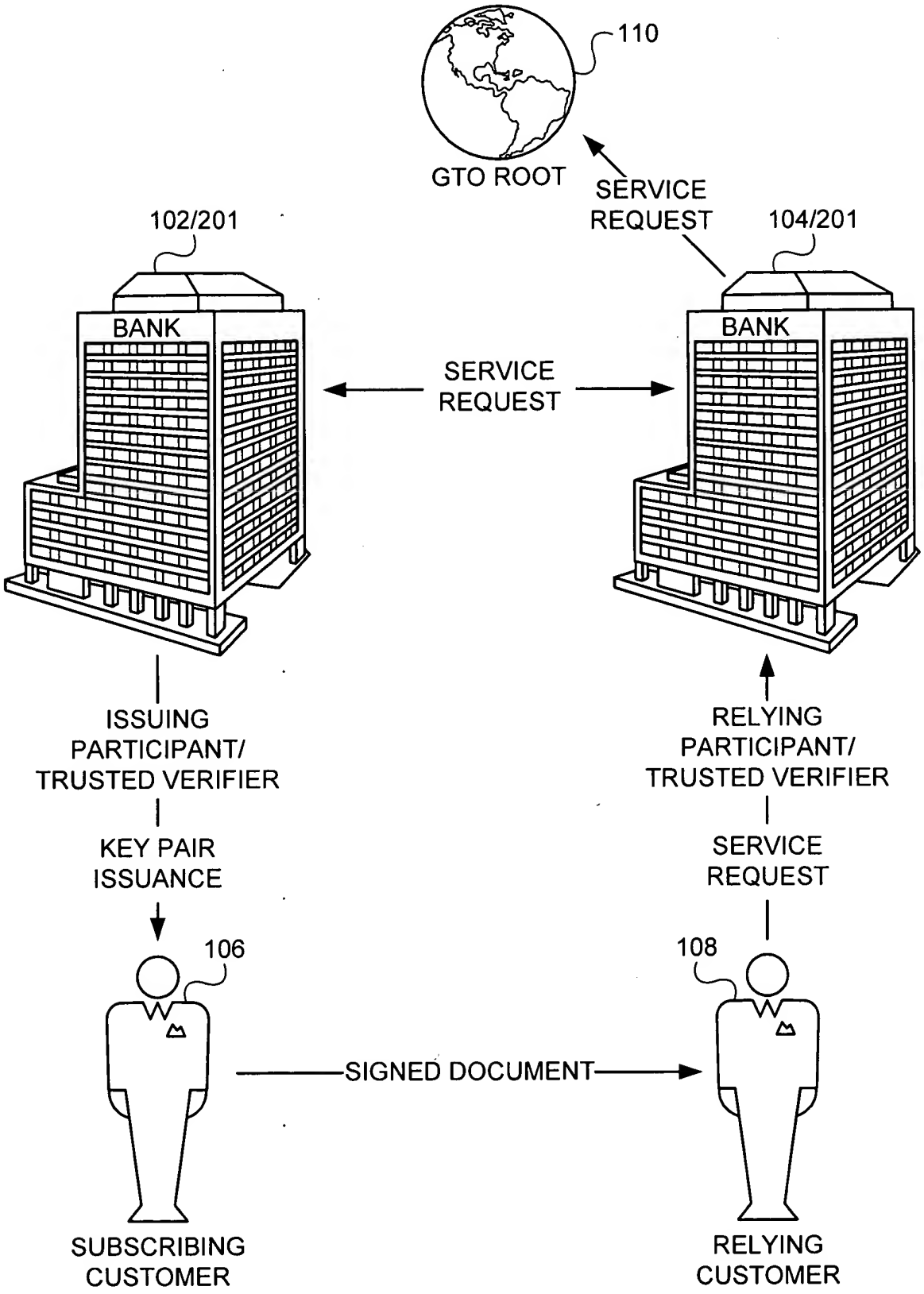
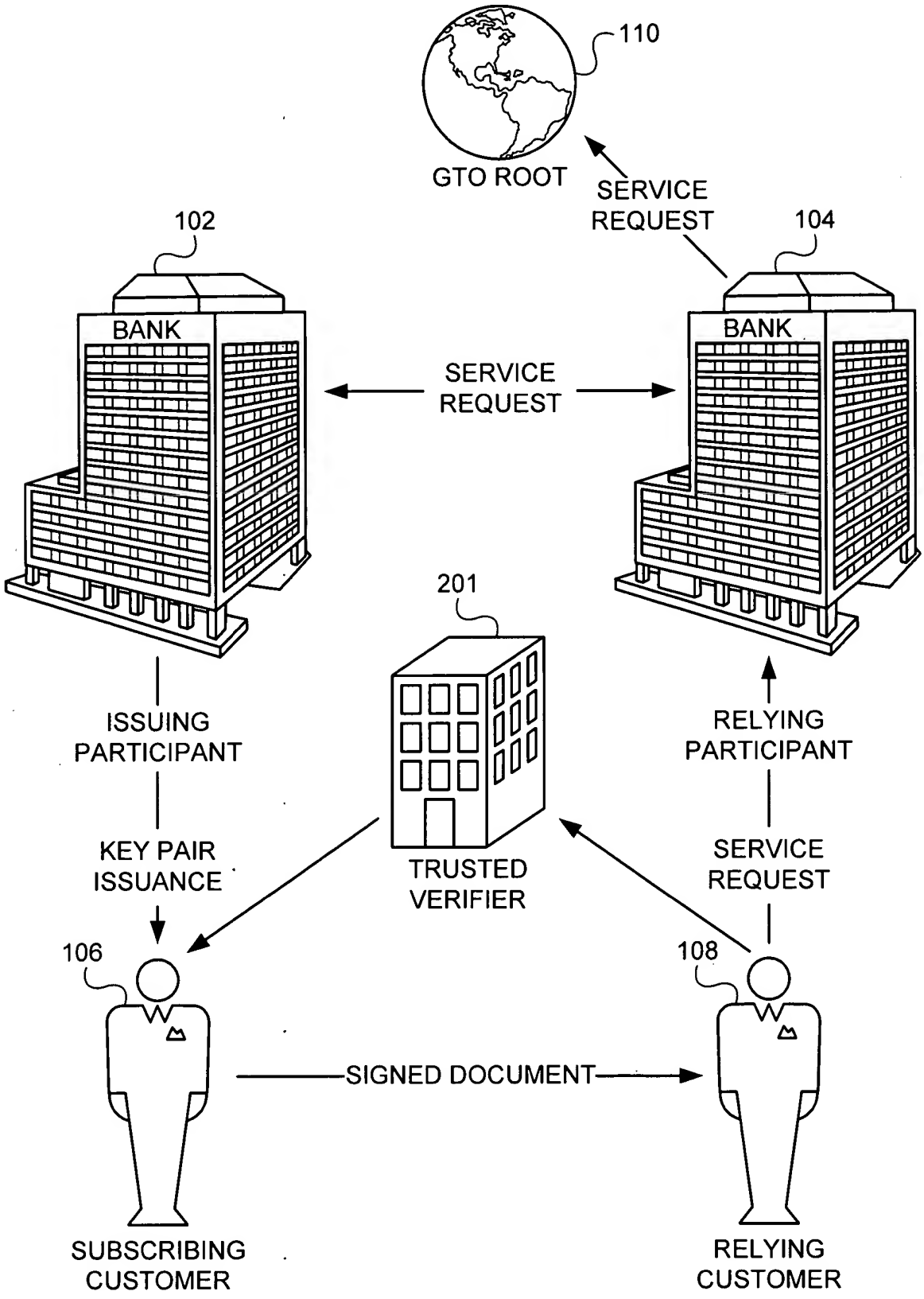


FIG. 1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GTO ROOT
SERVICE REQUEST
102
104
BANK
BANK
SERVICE REQUEST
201
ISSUING PARTICIPANT
RELYING PARTICIPANT
KEY PAIR ISSUANCE
TRUSTED VERIFIER
SERVICE REQUEST
106
108
SIGNED DOCUMENT
SUBSCRIBING CUSTOMER
RELYING CUSTOMER

FIG. 2

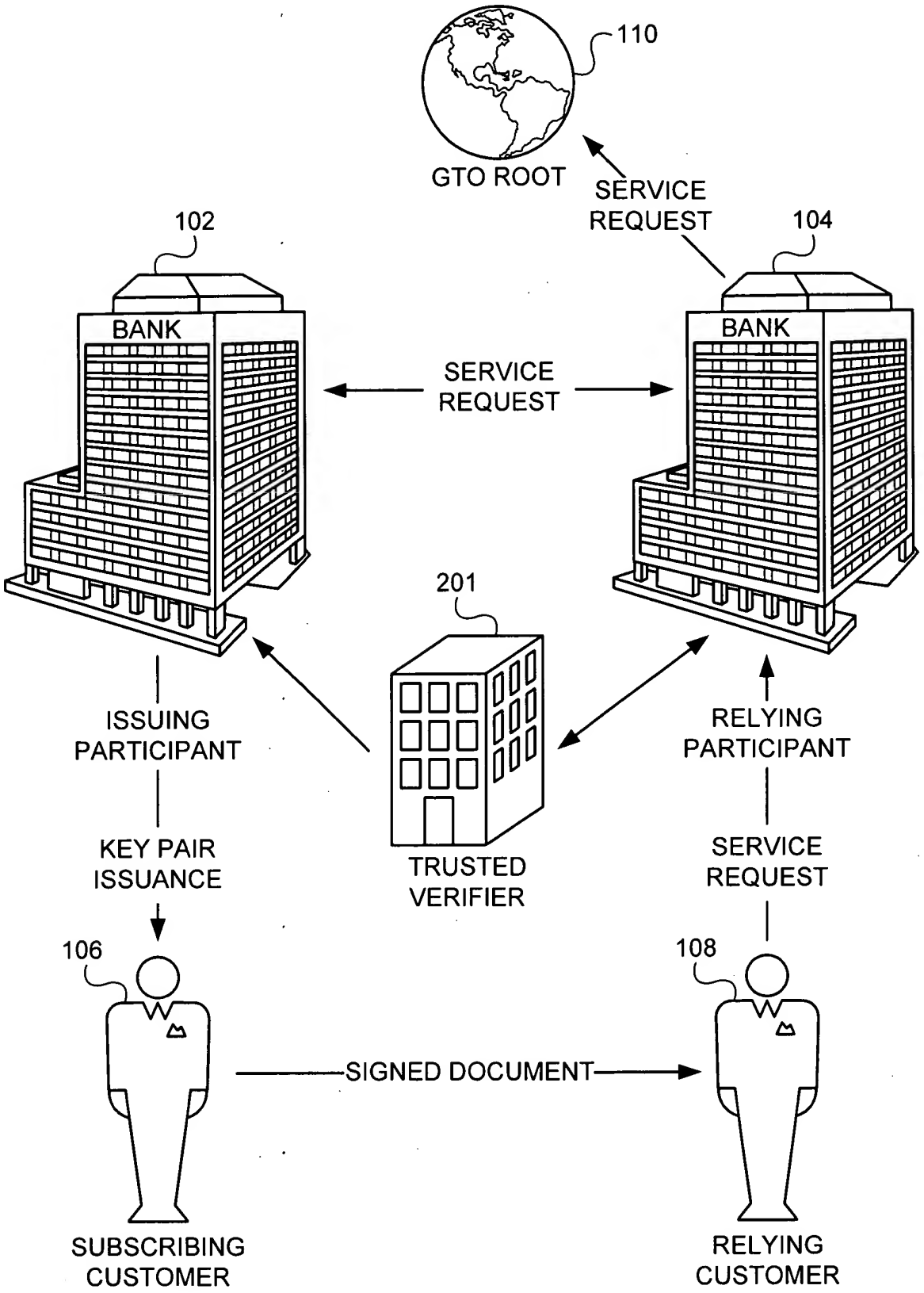
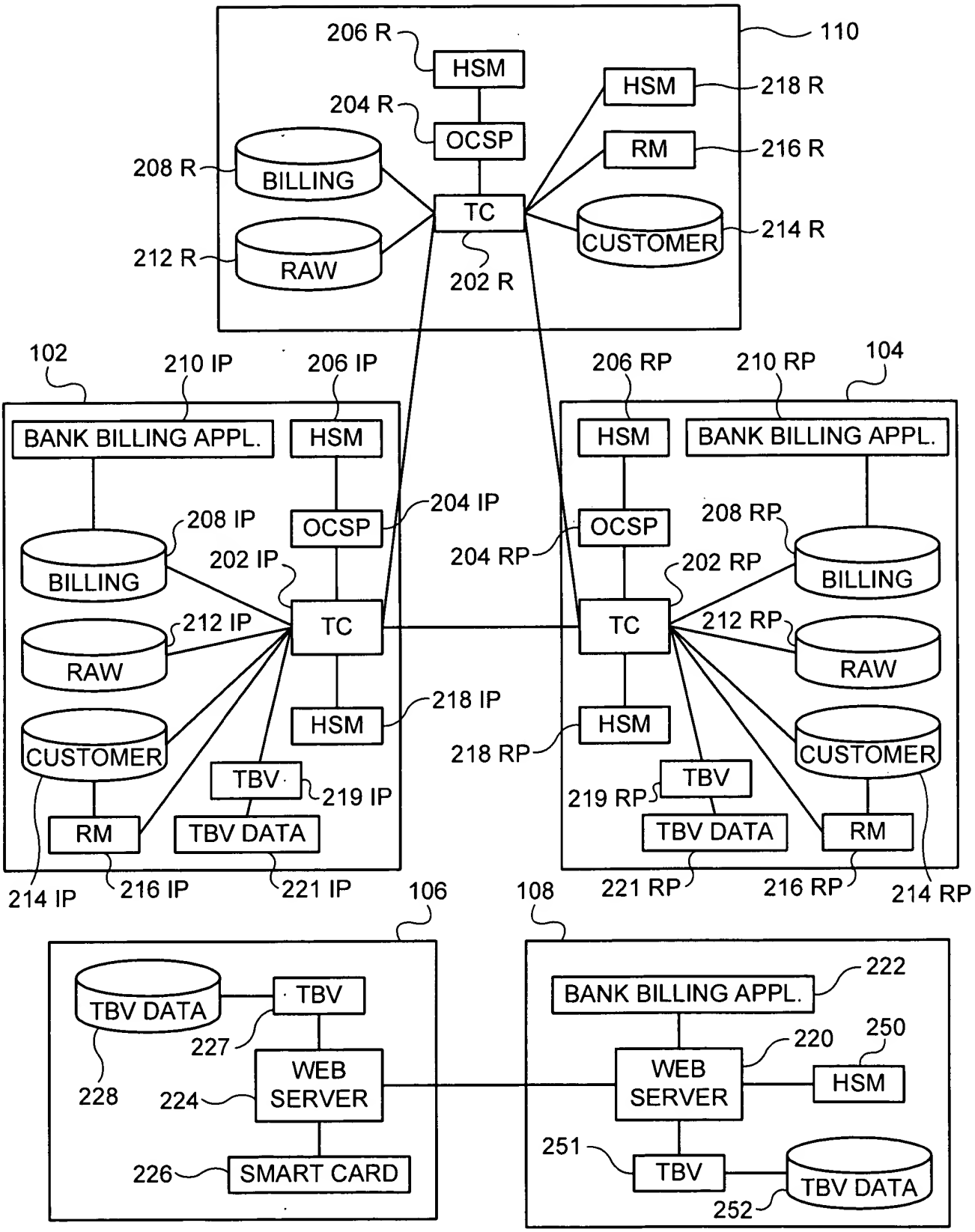

110
GTO ROOT
SERVICE REQUEST
102
104
BANK
BANK
SERVICE REQUEST
201
ISSUING PARTICIPANT
RELYING PARTICIPANT
KEY PAIR ISSUANCE
TRUSTED VERIFIER
SERVICE REQUEST
106
108
SIGNED DOCUMENT
SUBSCRIBING CUSTOMER
RELYING CUSTOMER

FIG. 3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206 R
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204 R
OCSP
208 R
BILLING
212 R
RAW
TC
202 R
HSM
218 R
RM
216 R
CUSTOMER
214 R
102
210 IP
206 IP
104
206 RP
210 RP
BANK BILLING APPL.
HSM
OCSP
208 IP
204 IP
202 IP
BILLING
TC
212 IP
RAW
CUSTOMER
HSM
218 IP
TBV
219 IP
RM
TBV DATA
214 IP
216 IP
221 IP
204 RP
208 RP
202 RP
212 RP
218 RP
219 RP
221 RP
216 RP
214 RP
106
108
TBV DATA
TBV
227
228
WEB SERVER
224
SMART CARD
226
222
250
220
251
252

FIG. 4

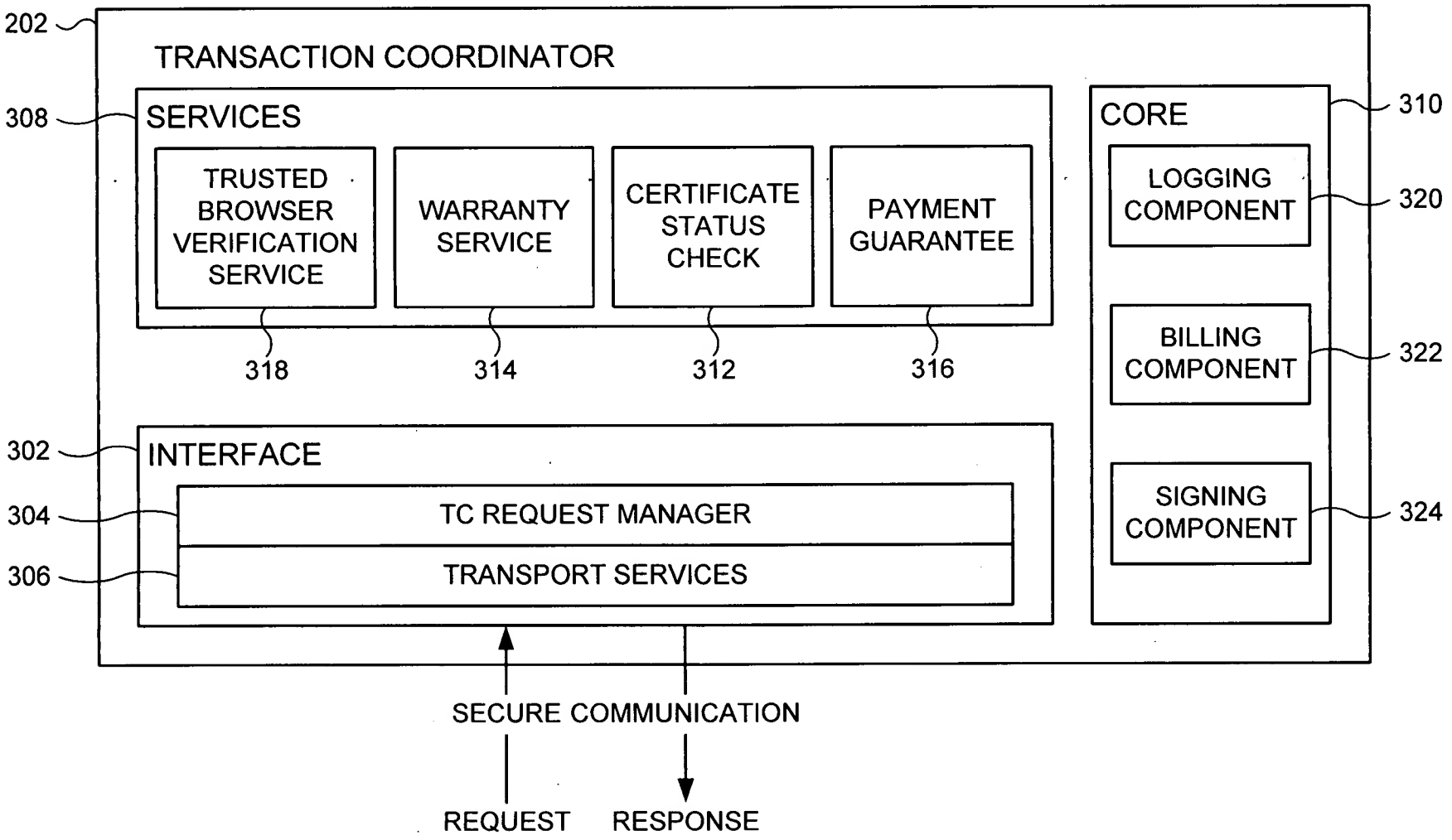
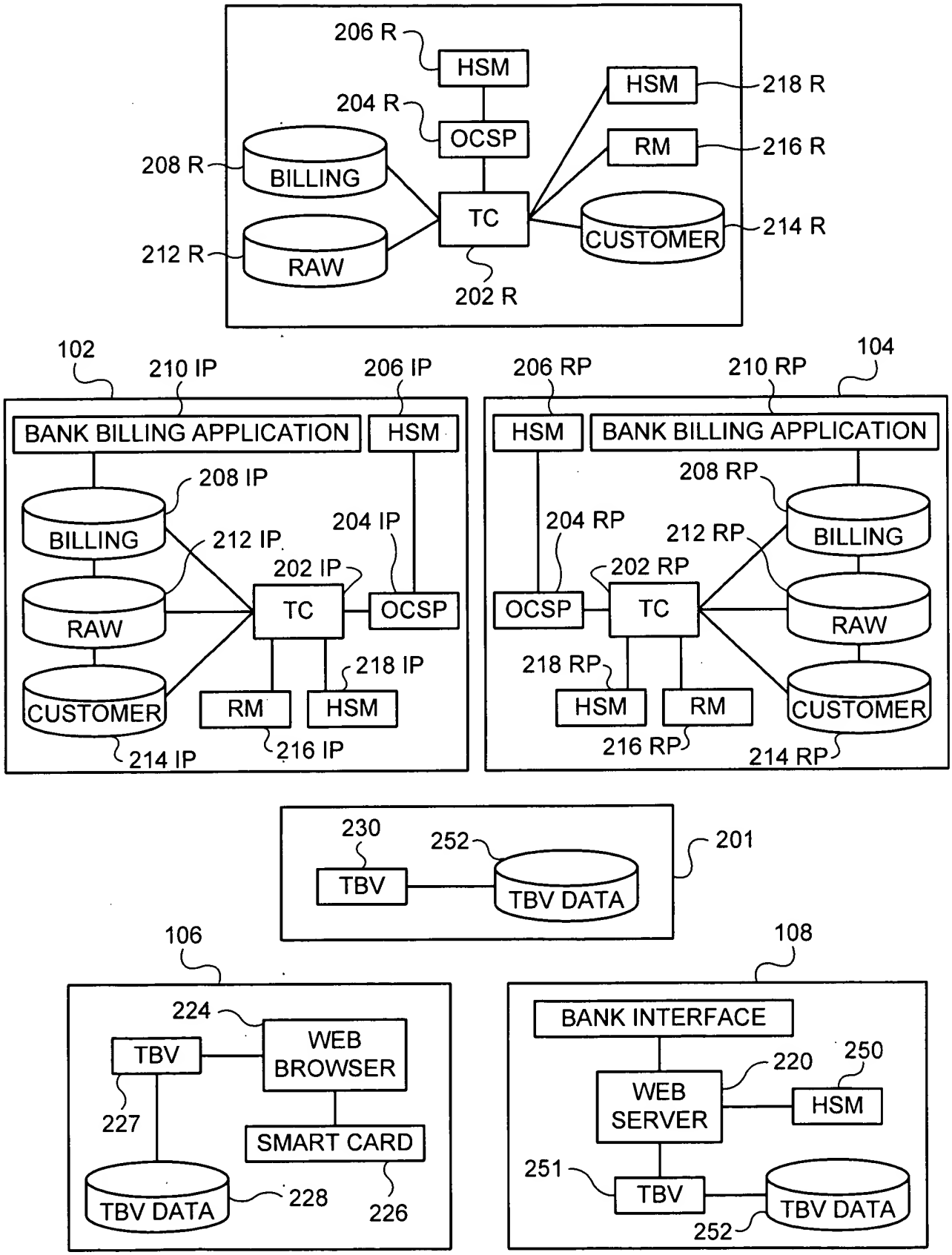


FIG. 5

Inventor: Khaja Ahmed
Serial No.: 09/845,221; Filed: 04/30/2001
Atty. Docket: 20068170-0089
Replacement Sheet 5 of 12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218 R
RM
216 R
CUSTOMER
214 R
102
210 IP
206 IP
BANK BILLING APPLICATION
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208 IP
BILLING
212 IP
204 IP
202 IP
RAW
TC
OCSP
CUSTOMER
RM
HSM
218 IP
214 IP
216 IP
206 RP
210 RP
104
HSM
BANK BILLING APPLICATION
208 RP
204 RP
212 RP
BILLING
202 RP
OCSP
TC
RAW
218 RP
HSM
RM
CUSTOMER
216 RP
214 RP
230
252
201
TBV
TBV DATA
106
224
WEB BROWSER
TBV
227
SMART CARD
TBV DATA
228
226
108
BANK INTERFACE
220
250
WEB SERVER
HSM
251
TBV
TBV DATA
252

FIG. 6

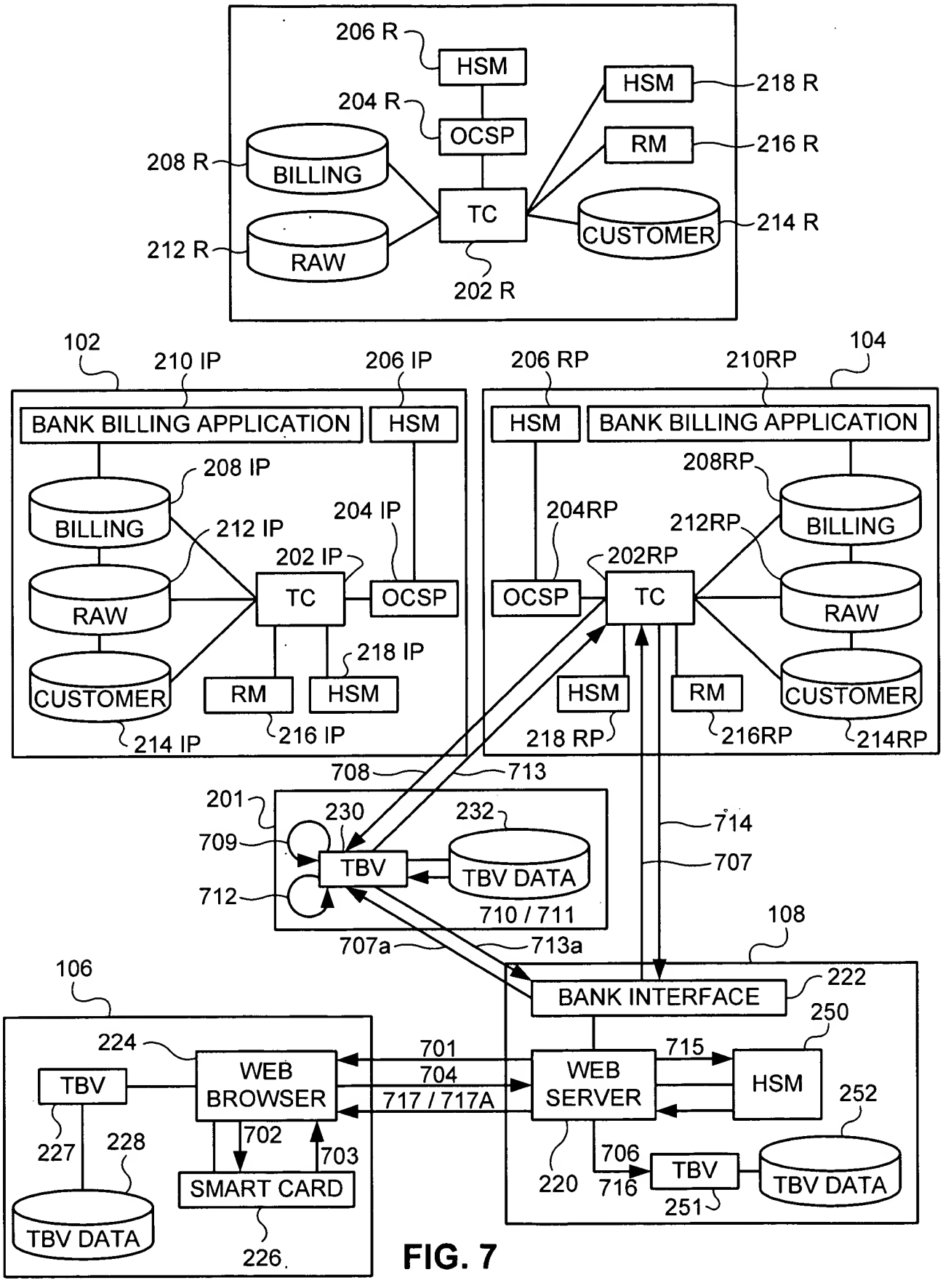

206 R
HSM
204 R
OCSP
208 R
BILLING
212 R
RAW
TC
202 R
HSM
218 R
RM
216 R
CUSTOMER
214 R
102
210 IP
206 IP
BANK BILLING APPLICATION
HSM
208 IP
204 IP
212 IP
202 IP
BILLING
RAW
TC
OCSP
CUSTOMER
RM
HSM
218 IP
214 IP
216 IP
206 RP
210RP
104
HSM
BANK BILLING APPLICATION
208RP
204RP
212RP
202RP
BILLING
OCSP
TC
RAW
HSM
RM
CUSTOMER
218 RP
216RP
214RP
708
713
201
230
232
709
TBV
TBV DATA
712
710 / 711
714
707
108
707a
713a
106
BANK INTERFACE
222
250
224
701
704
717 / 717A
WEB BROWSER
WEB SERVER
715
HSM
252
TBV
227
228
702
703
SMART CARD
TBV DATA
226
706
220
716
TBV
251
TBV DATA

FIG. 7

PURCHASE ORDER	DIGITAL SIGNATURE OF EACH SIGNED COMPONENT RUNNING IN THE BROWSER ENVIRONMENT

PURCHASE ORDER	DIGITAL SIGNATURE OF EACH SIGNED COMPONENT RUNNING IN THE BROWSER ENVIRONMENT	UNSIGNED CODE RUNNING IN BROWSER ENVIRONMENT

PURCHASE ORDER	DIGITAL SIGNATURE OF EACH SIGNED COMPONENT RUNNING IN THE BROWSER ENVIRONMENT	UNSIGNED CODE RUNNING IN BROWSER ENVIRONMENT	CODE OF EACH SIGNED COMPONENT RUNNING IN THE BROWSER ENVIRONMENT

FIG. 8

	HASHES MATCH	HASHES DO NOT MATCH
IDENTITY OF SIGNER KNOWN, AUTHORIZED ENTITY	GOOD	BAD
IDENTITY OF SIGNER KNOWN, UNAUTHORIZED ENTITY	UNKNOWN	BAD
IDENTITY OF SIGNER UNKNOWN	UNKNOWN	BAD

FIG. 9

	HASHES MATCH	HASHES DO NOT MATCH
IDENTITY OF SIGNER KNOWN, AUTHORIZED ENTITY	GOOD	BAD
IDENTITY OF SIGNER KNOWN, UNAUTHORIZED ENTITY	BAD	BAD
IDENTITY OF SIGNER UNKNOWN	UNKNOWN	BAD

FIG. 10

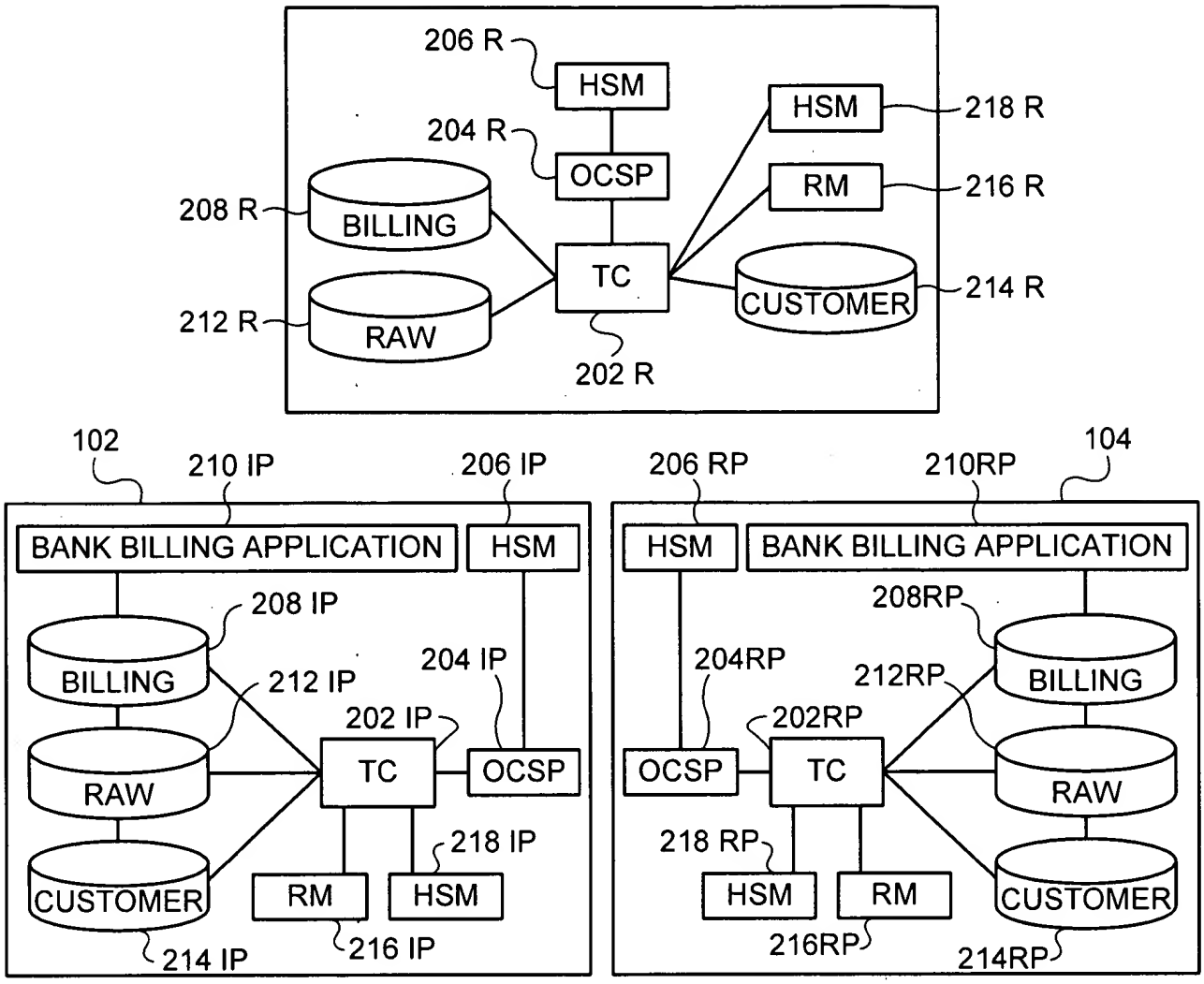
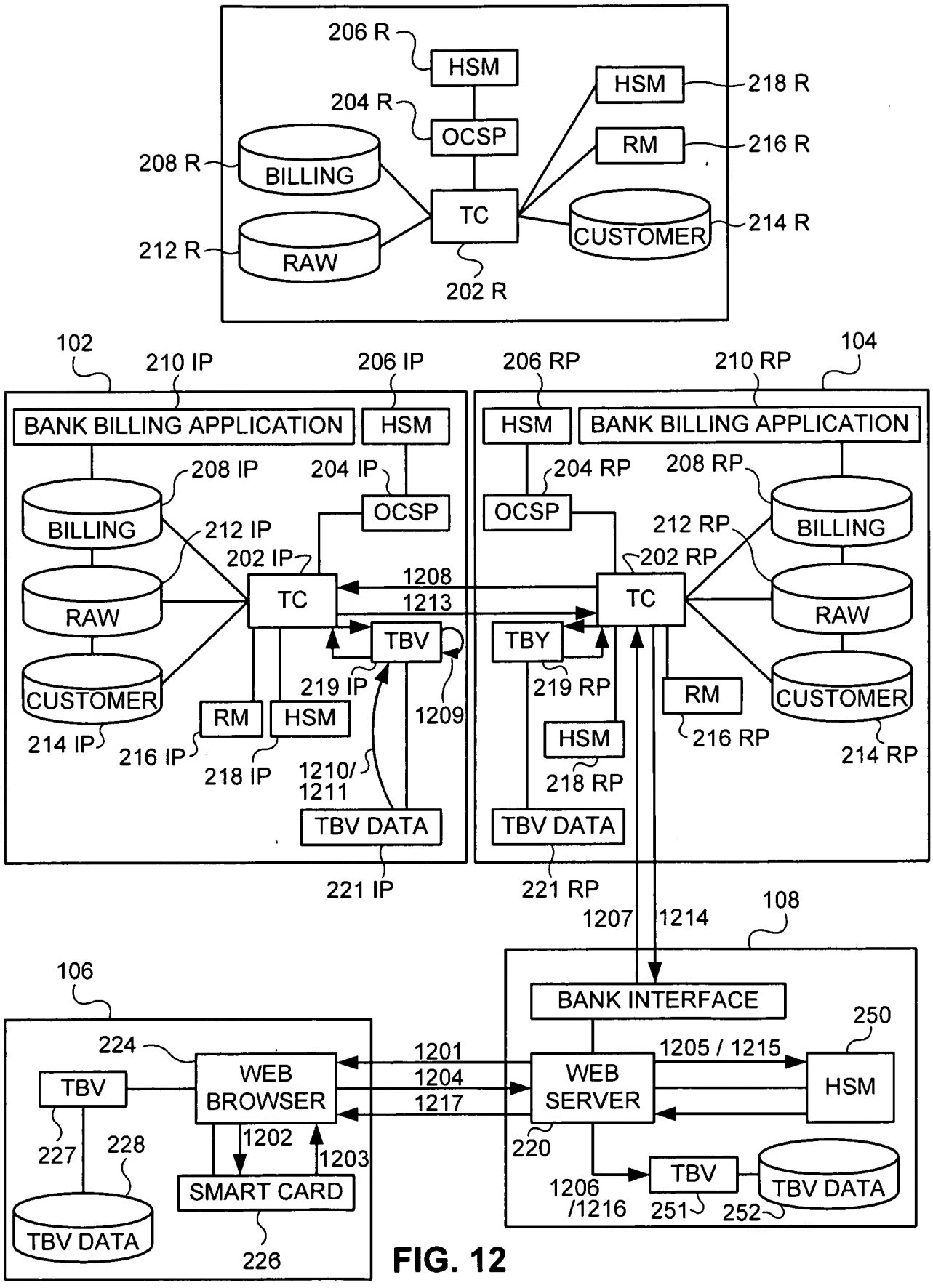

206 R
HSM
204 R
OCSP
208 R
BILLING
212 R
RAW
TC
202 R
HSM
218 R
RM
216 R
CUSTOMER
214 R
102
210 IP
206 IP
BANK BILLING APPLICATION
HSM
208 IP
BILLING
212 IP
204 IP
202 IP
RAW
TC
OCSP
218 IP
CUSTOMER
RM
HSM
214 IP
216 IP
206 RP
210RP
104
HSM
BANK BILLING APPLICATION
208RP
204RP
212RP
BILLING
202RP
OCSP
TC
RAW
218 RP
HSM
RM
CUSTOMER
216RP
214RP
230
232
201
TBV
TBV DATA
108
106
1105
1104
BANK INTERFACE
250
220
1107
224
1101
WEB
BROWSER
1106
WEB
SERVER
HSM
1109
TBV
1102
227
228
1103
1108
SMART CARD
TBV
TBV DATA
TBV DATA
251
252
226

FIG. 11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HSM
218 R
RM
216 R
CUSTOMER
214 R
102
210 IP
206 IP
206 RP
210 RP
104
BANK BILLING APPLICATION
HSM
HSM
BANK BILLING APPLICATION
208 IP
204 IP
204 RP
208 RP
OCSP
OCSP
BILLING
212 IP
212 RP
BILLING
202 IP
202 RP
1208
1213
RAW
TC
TC
RAW
TBV
TBY
CUSTOMER
219 IP
219 RP
RM
CUSTOMER
1209
RM
HSM
HSM
214 IP
216 IP
218 IP
1210/
1211
216 RP
218 RP
214 RP
TBV DATA
TBV DATA
221 IP
221 RP
1207
1214
108
106
BANK INTERFACE
250
224
1201
1205 / 1215
WEB
BROWSER
1204
WEB
SERVER
HSM
TBV
1217
227
228
1202
1203
220
SMART CARD
TBV
TBV DATA
1206
/1216
251
252
TBV DATA
226

FIG. 12